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Awareness on the armamentarium used in aesthetic restorative procedure among dental students

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***Abstract*---**Introduction: The aesthetic dentistry mainly involves restoring the best smile back to the patients. This mainly involves the tooth colour, proper alignment, with proper shape of the tooth and also with all the properties of the tooth. The dental instruments are used to examine, clean, cut and restore the tooth structures. They mainly consist of hand-held, auxiliary and rotary instruments. Aim: To evaluate the knowledge and awareness of the armamentarium used in the aesthetic restorative procedure. Materials and method: The survey was conducted by preparing the questionnaire pertaining to the topic and it was circulated through an online portal. The participants were informed in detail about the study and the informed consent was obtained for everyone and they participated willingly. The response collected and observations were made. Results and discussion: From the responses obtained it was seen that the students were about the aesthetic restorative procedures, aware of the hand instruments used for operative dentistry, common shade used in the composite restoration. Uses of plastic instruments. They also had good knowledge on the duration that the restoration lasts. Conclusion: It was concluded that the dental students had good

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awareness of the armamentarium used in aesthetic restorative procedures but lacked some knowledge.

***Keywords*---**aesthetics, armamentarium, restoration, innovative techniques.

Introduction

Aesthetics is something that means understanding of beauty. The first thing people see on the face is the attractive smile that a person carries for himself/herself. The perfect smile of a person also adds on to one's personality and has effects on psychology. The most attractive feature of the face is a smile. To make this look perfect, there should be proper alignment, colour, no decays or any malocclusion. To achieve this restorative dentistry plays a major role (1). The operative dentistry plays a major role in restorative dentistry and generally only one function is done by one instrument. The function is learnt through dental education. The instruments mainly involved are used for the placements, shaping and carving of the restoration. The operative dentistry is mainly involved for the assessment of teeth that are needed to be restored and saved from extraction (2). Outline and the shape of the tooth is very essential in the aesthetic dentistry that forms the base for the operative dentistry. The rotary instruments sometimes cause injury by over cutting the cavo- surface of the interproximal surface. Hence the use of hand instruments for maintaining the shape and structure of the tooth also to maintain the properties of the tooth (3). The LED light curing sources are the most used light cures in the field of dentistry, the blue light that is being transmitted causes eye damage on exposure to naked eye and hence precautions are taken (4).

Based on the previous studies conducted, it can be said that the study conducted by Panagiotis et al mentioned the rotary instruments and their efficiency in operative dentistry. 55 studies were taken where some were laboratory studies and remaining was clinical studies. The prisma chart was done and the results obtained. It was found that the oscillating diamond instrument constitutes a tool that refines the restoration (5). The study conducted by patricia et al was the case report where the female patients were taken who complained of having a white lesion on the facial surface where they reach out for a dentist since it's not aesthetically appealing. The preferred method of treating this is by using the direct composite resin veneers which gives high quality of aesthetic smile if the procedure is performed correctly (6). Hugo in his study mentioned the preparation and the restoration of small interproximal surfaces using the sonic instruments. It was found that many cavity designs were prepared using these instruments and it is used. The margins are enhanced without the adjacent tooth surfaces (7).

From the studies done, it was seen that many studies were conducted based on the armamentarium used in operative dentistry but negligible surveys were done among the dental students. Our team has extensive knowledge and research experience that has translated into high quality publications (8–17),(18–21),(22–26) (27). The aim of this study was to assess the awareness of dental students on the armamentarium used in aesthetic restorative procedure.

Materials and Method

Study design

The survey was conducted among the dental student population in Chennai to evaluate the awareness of the armamentarium used in aesthetic restorative procedure. The sample size of the survey was 100. The participants undertook the survey voluntarily and no incentives were given to them. Ethical approval and informed consent from the participants were obtained. The study was conducted in the month of February 2021.

Survey instrument

The survey instrument which was a questionnaire was prepared after extensive review of the existing literature. The questionnaire was reviewed and amendments were made to improve clarity of the questions to eliminate ambiguous responses. The questionnaire consisted of a total of 12 questions. The questionnaire was shared to the rural population of Chennai using an online platform.

Data analysis

Only completed surveys were taken for analysis and the uncompleted surveys were eliminated. The test used is descriptive statistics. All the responses obtained were tabulated and reliability of data was checked. The statistics was done using SPSS software.

Results

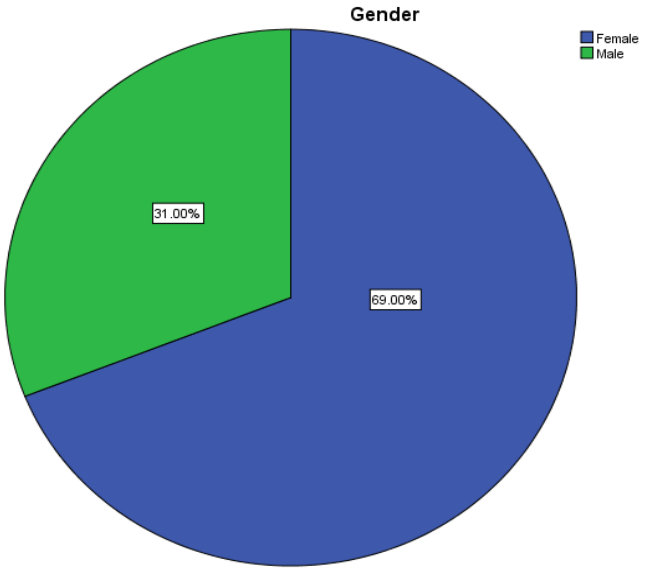

Figure 1: pie chart showing the percentage distribution of gender of the population. Majority of the participants 69% were females (blue) and 31% were males (green).

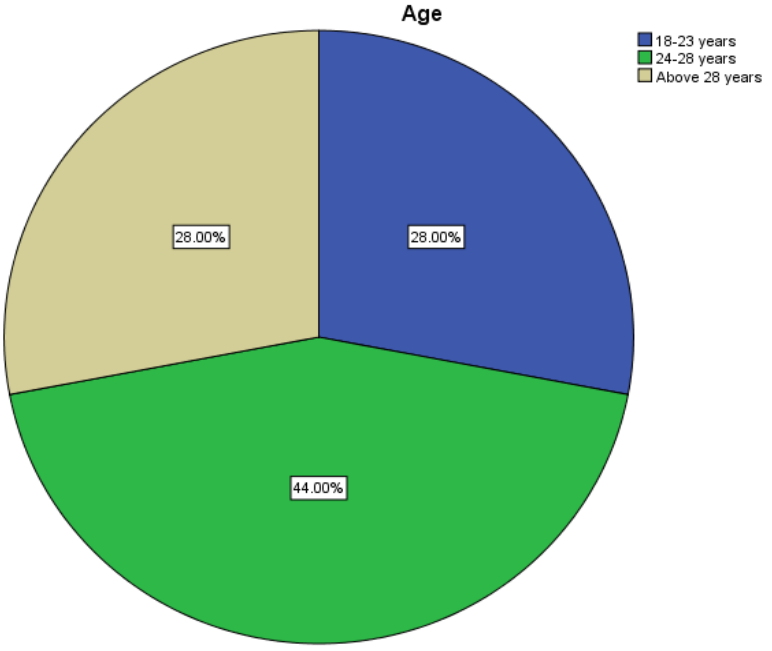

Figure 2: pie chart showing the percentage distribution of age group of the population. Majority of the participants 44% belonged to the age group of 24-28 years (green), 28% belonged to 18-23 years (blue) and 28% belonged to the age group above 28 years (brown).

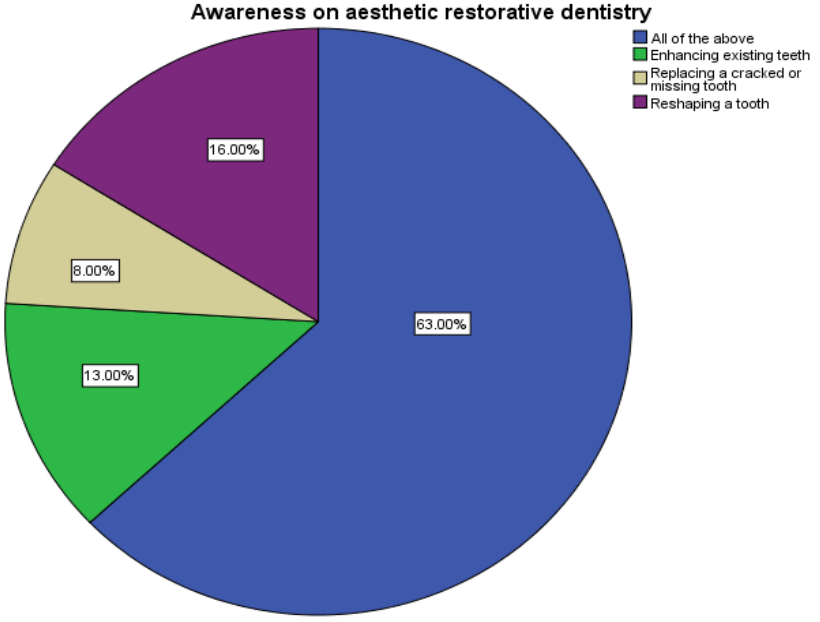

Figure 3: the pie chart showing the percentage distribution of awareness on aesthetic restorative dentistry. Majority of the participants 63% responded all of

the above (blue), 16% responded reshaping a tooth (purple), 13% responded enhancing existing teeth (green) and 8% responded by replacing a cracked or a missing tooth (brown).

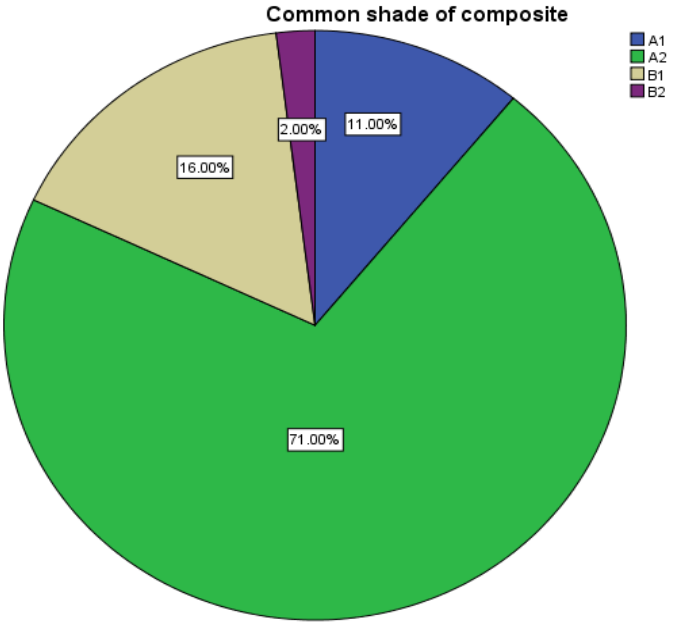

Figure 4: pie chart showing the percentage distribution of common shade used during composite restoration. Majority of the participants 71% responded A2 (green), 16% responded B1 (brown), 11% responded A1 (blue) and 2% responded B2 (purple).

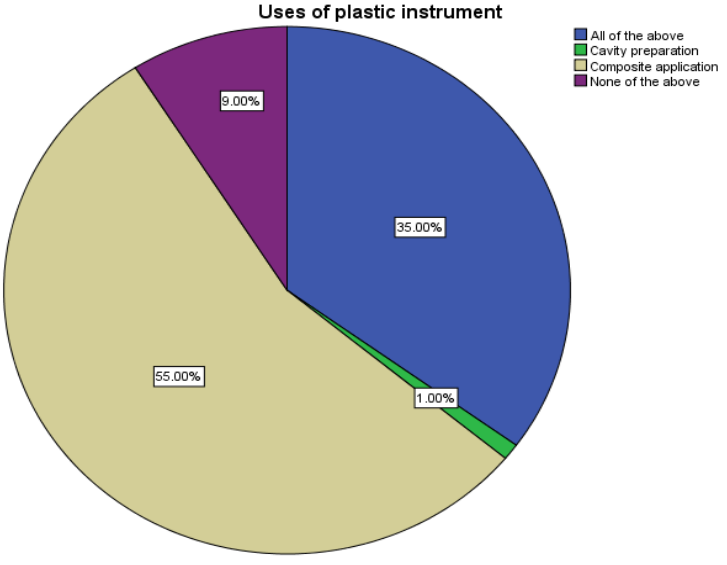

Figure 5: pie chart showing the percentage distribution of uses of plastic instruments. Majority of the participants 55% responded composite (brown), 35%

responded all of the above (blue), 9% responded none of the above (purple) and 1% responded cavity preparation (green).

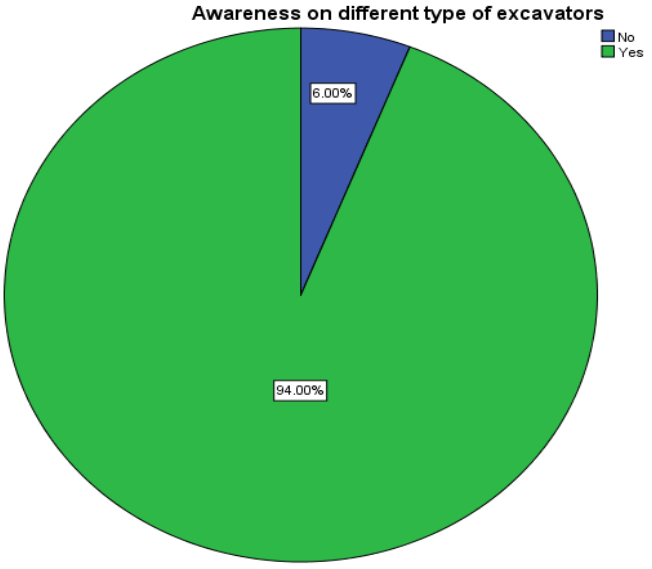

Figure 6: pie chart showing the percentage distribution of awareness on different types of excavators. Majority of the participants 94% responded yes (green) and 9% responded no (blue).

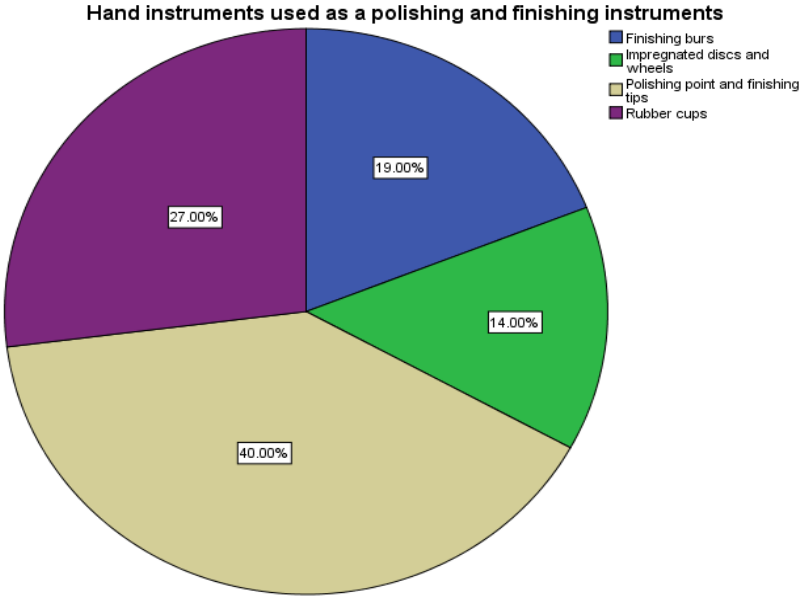

Figure 7: pie chart showing the percentage distribution of Hand instruments used as polishing and finishing instruments. Majority of the respondents, 40% mentioned polishing points and finishing tips (brown) , 27% responded to rubber cups (purple), 19% responded finishing burs (blue), 14% responded to impregnated discs and wheels (green).

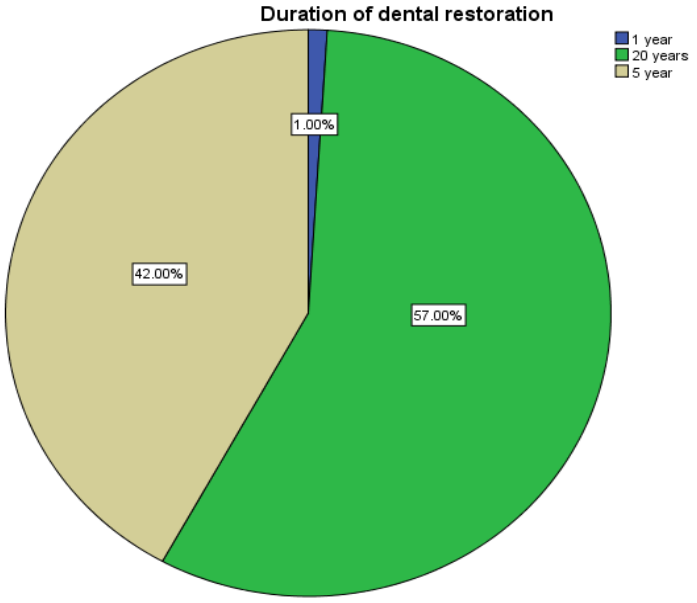

Figure 8: pie chart showing the percentage distribution of duration of dental restoration. Majority of the participants, 57%, responded 20 years (green), 42% responded 5 years (brown) and 1% responded 1 year (blue).

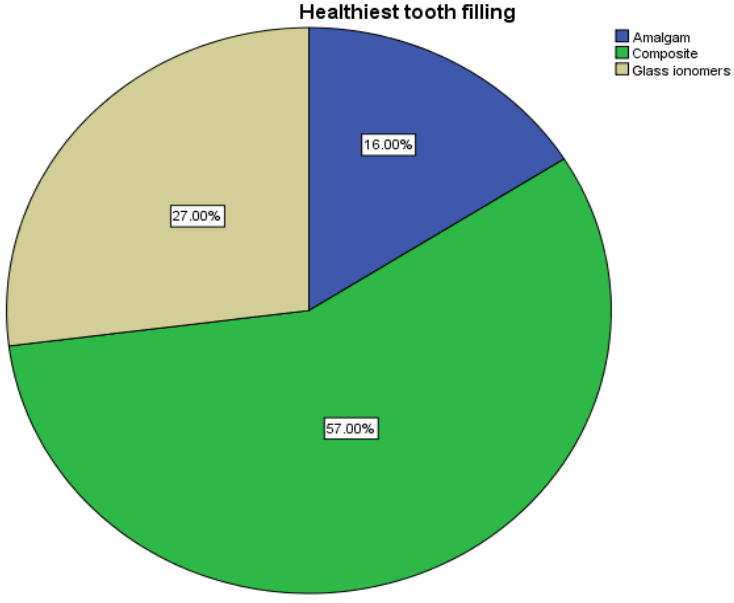

Figure 9: pie chart showing the percentage distribution of knowledge on healthiest tooth filling. Majority of the participants 57% responded composite (green), 27% responded glass ionomer (brown) and 16% responded amalgam (blue).

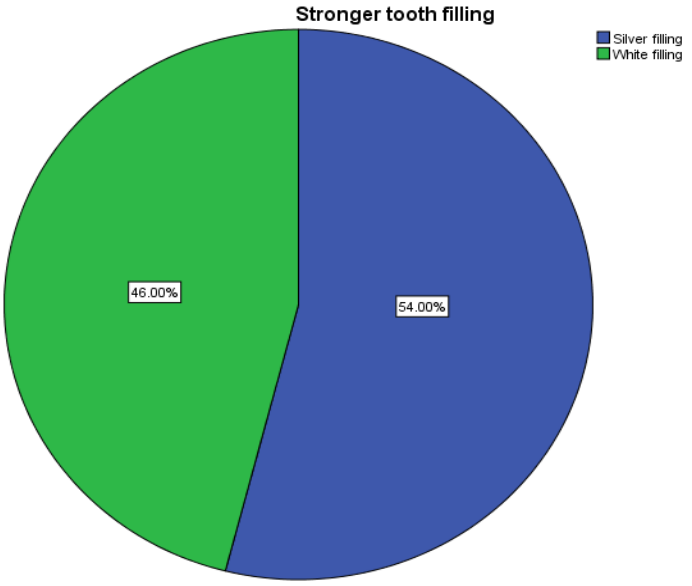

Figure 10: pie chart showing the percentage distribution of knowledge on the stringer tooth following. Majority of the participants 54% responded to silver filling (blue) and 46% responded white filling (green).

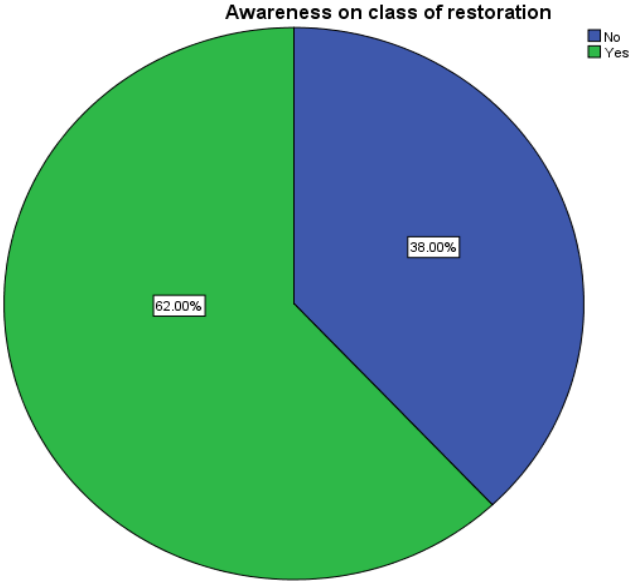

Figure 11: pie chart showing the percentage distribution of awareness on classes of restoration. Majority of the participants 62% responded yes (green) and 38% responded no (blue).

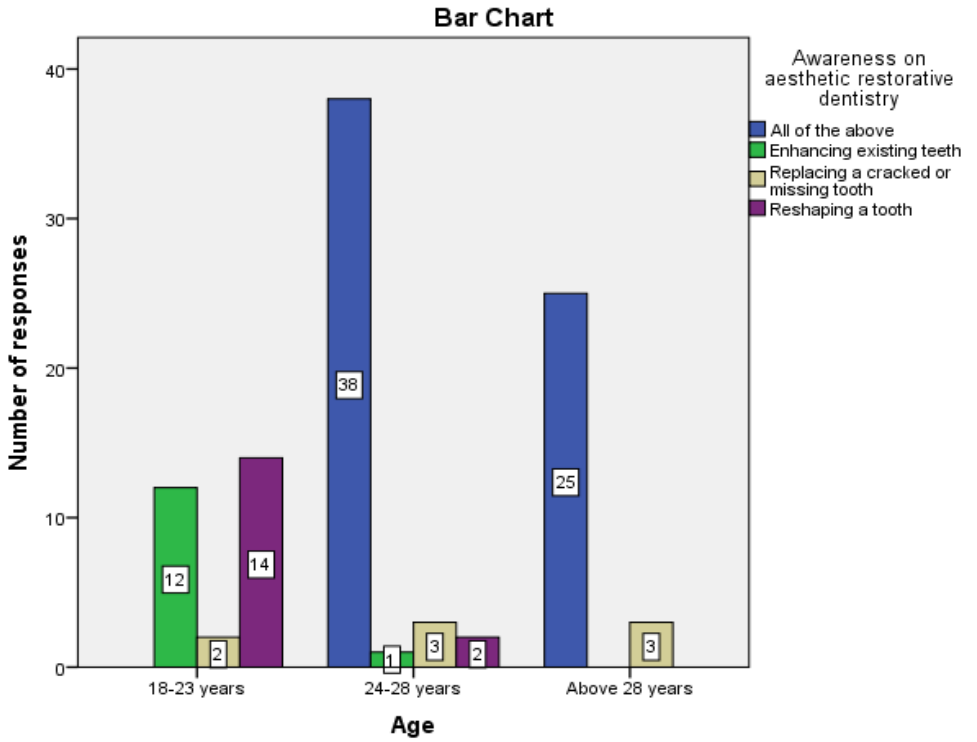

Figure 12: The bar graph showing the comparison of responses between the age of participants and their awareness on aesthetic restorative dentistry. X-axis represents the age of participants and y-axis represents the number of participants. Blue colour represents all of the above, green colour exhibits enhancing the existing tooth, brown colour denotes replacing cracks or missed teeth and purple represents reshaping the tooth. Majority of the participants belonging to the age 24-28 years (38) feel that of all the three belongs to aesthetic dentistry. , it was statistically significant. (chi-square test p= 0.000- indicating statistically significant)

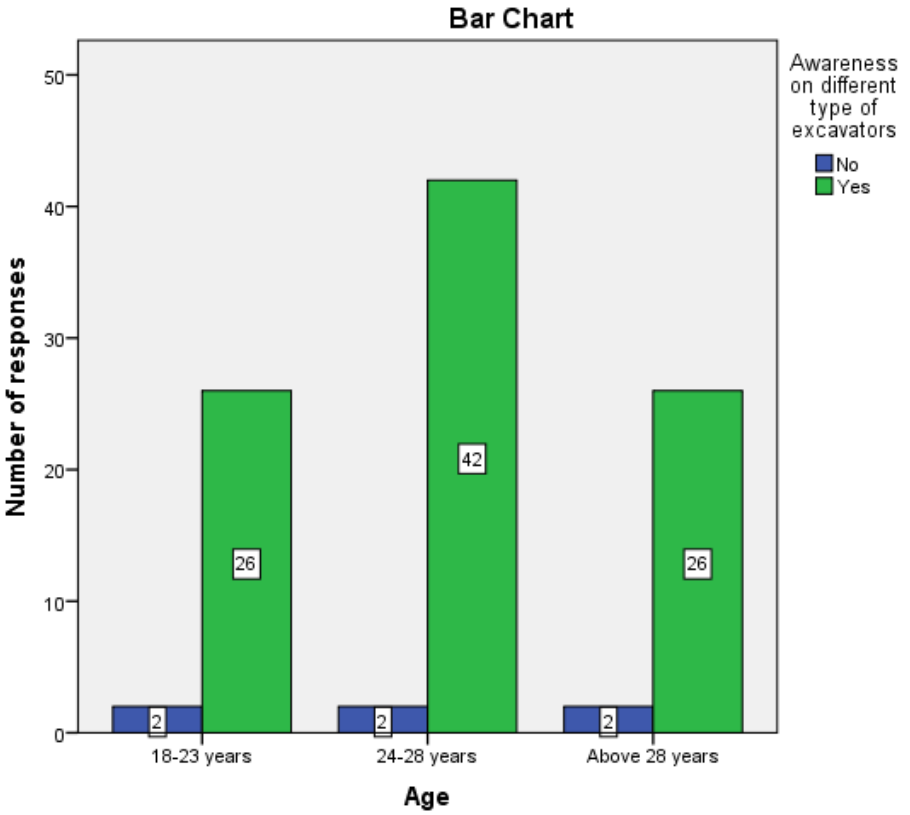

Figure 13: The bar graph showing the comparison of responses between the age of participants and their awareness on different types of excavators available. X-axis represents the age of participants and the y-axis represents the number of participants. Green colour showing the yes and blue colour is showing no. Majority of the participants belonged to the age 24-28 years (42) that they are aware of, it was statistically significant. (chi-square test p= 0.000- indicating statistically significant)

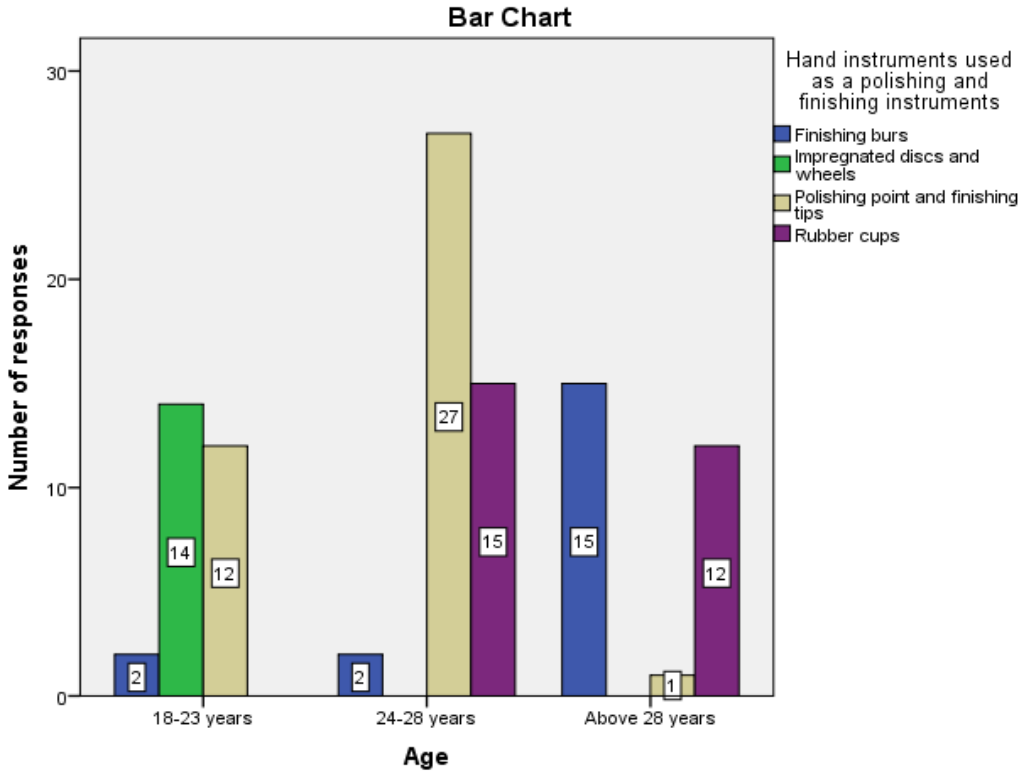

Figure 14: The bar graph showing the comparison of responses between the age of participants and their awareness of the hand instruments used as polishing agents. X-axis represents the age of participants and the y-axis represents the number of participants. Green colour showing the impregnated discs and wheels, blue colour is showing finishing burs, brown colour represents polishing points and finishing tips. Majority of the participants belonged to the age 24-28 years (27) and they are aware that the polishing point and finishing tips are used as the finishing and polishing instruments, it was statistically significant. (chi-square test p= 0.000- indicating statistically significant)

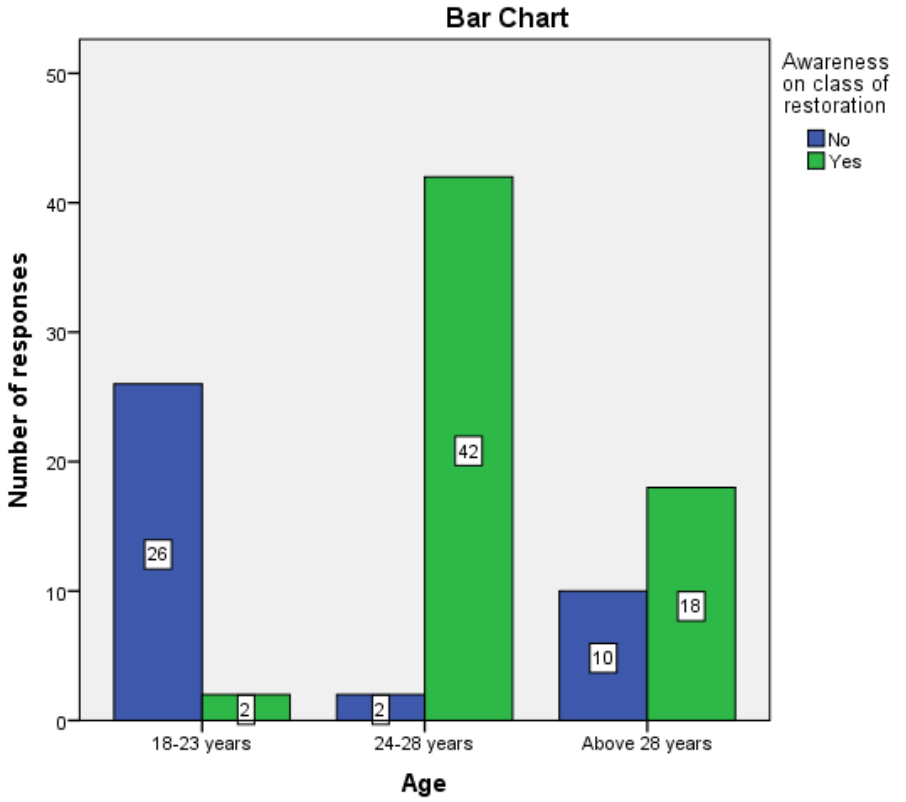

Figure 15: The bar graph showing the comparison of responses between the age of participants and their awareness on the classes of restoration. X-axis represents the age of participants and the y-axis represents the number of responses. Green colour showing the yes and blue colour is showing no. Majority of the participants belonging to the age 24-28 years (42) responded that they are aware of the class of restoration, it was statistically significant. (chi-square test p= 0.000- indicating statistically significant)

From the results obtained it can be seen that, the majority of the participants were found to be females with 69% and the participants belonging to the age group 24-28 years were the majority with the percentage of 44%. 63% of the participants were aware about aesthetic restorative dentistry. The most common shade of composite that is being used in restoration was A2 and majority of the participants 71% responded the same. 55% of the participants responded that composite application is the use of plastic instruments. When questioned about their awareness on the types of excavators used in restoration, 94% of the participants responded positively. 40% of the participants responded that polishing points and finishing tips are used for polishing and finishing. 57% of the participants responded that the duration of the restoration is 20 years. 57% of the participants responded that composite is the healthiest healthiest tooth filling and 54% of the participants responded that stronger tooth filling is silver filling. 62% were aware about the class of restoration.

Discussion

Dental aesthetics is the most important factor that plays an important role in appearance and building up social interaction. People always desire for white teeth and also for a perfect smile. Tooth colour, shape, properties needed to be perfect for this. There are a wide variety of instruments that are used in operative and aesthetic dentistry (28). The study mainly involves the dental students and their knowledge and awareness on the instruments that are used in aesthetic restorative procedures.

From figure 3, it can be seen that the majority of the participants 63% were aware about the aesthetic dentistry and the procedures done, where they responded that it involves restoration of tooth, replacement of the cracked or missing tooth and also enhancing the existing tooth. 16% responded that it only involves reshaping of the tooth, 13% of the participants responded that it only enhances the existing tooth and 8% responded that aesthetics is only for replacement of broken or missing teeth.

Figure 4 shows the common shade that is used in composite filling. Majority of the participants responded that A2 is the most frequently used one, followed by 16% of the participants responding for B2, 11% of the participants for A1 and 2% of the participants responded for B2. Similar results were obtained in the study conducted by Tim where he took the advice and opinion of the patients on the shade selection of teeth (29).

In Figure 5, the dental students were asked about the uses of plastic instruments and 55% of the participants responded for composite application, which was not the only use of the plastic instrument. 35% of the participants responded that it is used for cavity preparation as well as for the composite application. 9% of the respondents opted for none of the above and 1% for only cavity preparation.
In figure 6, 94% of the participants responded that they are aware about the different types of excavators such as hoe, discoid, cleoid and spoon whereas 6% of the participants responded that they aren't aware.

In figure 7, the hand instruments that are used for polishing and finishing was questioned. The majority of the participants 40% responded to polishing points and finishing tips, 27% of the participants responded for rubber cones, 19% of the participants responded that finishing burs are used and 14% of the participants responded for impregnated discs and wheels.

In figure 8, the duration of dental restoration was questioned. 57% of the participants responded that it lasts for 20 years, 42% of the participants responded for 5 years and 1% of the participants responded for 1 year.

Figure 9 shows the healthiest tooth filling that is done where 57% of the participants responded that composite fillings are the most common, 27% of the participants responded for the correct answer that is for the glass ionomer cement and 16%of the participants responded for the amalgam.

Figure 10 shows the strongest tooth filling and the majority of the participants 54% responded that silver filling is the strongest. 48% of the participants responded that white filling is the strongest.

Figure 11 shows the awareness of the class of restoration. It was seen that 62% of the participants responded that they were aware and whereas 38% of the participants responded that they weren't aware. The results from the study conducted by Christian was found to be similar since they compare the teeth of the patients before and after the treatment done in both dentists' and patients' perception on the treatment done (30).

Figure 12 shows the association between the age groups and their awareness on aesthetic restorative dentistry. Majority of the participants belonging to the age 24-28 years (38) feel that enhancing the existing teeth, replacing cracked or missing teeth and reshaping the teeth belongs to aesthetic dentistry. The p-value was found to be $p=0.000$ which is statistically significant since the $p<0.05$.

Figure 13 shows the association between the age groups and the awareness of the different types of excavators. Majority of the participants belonged to the age 24-28 years (42) and they are aware of the different types of excavators such as hoe, hatchet, discoid, cleoid etc. The p-value was found to be $p=0.000$ which is statistically significant since the $p<0.05$.

Figure 14 shows the association between the age groups and the knowledge on the hand instrument that are used as finishing and polishing instruments. Majority of the participants belonged to the age 24-28 years (27) and they are aware that the polishing point and finishing tips are used as the finishing and polishing instruments. The p-value was found to be $p=0.000$ which was statistically significant since the $p<0.05$.

Figure 15 shows the association between the different age groups and the awareness of the classes of restoration. Majority of the participants belonging to the age 24-28 years (42) responded that they are aware of the class of restoration. The p-value was found to be $p=0.000$ which was statistically significant since the $p<0.05$.

The limitation of this study is that the sample was limited and the study was restricted only to the dental students of Chennai and not the wider geography. The criteria that was included for the study was narrow. In the future, requirements of greater sample size, wider geography and the criteria included in the study should be wide to generalize the study.

Conclusion

From the study conducted and the results obtained it can be concluded that the dental student has good awareness of the armamentarium used in the aesthetic restorative procedures but they lack some knowledge on the instrument which makes clear that more knowledge and awareness is required.

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Conflict of interest:
The author declares that there was no conflict of interest in the present study.

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